WHAT IS CLAIMED IS:

1. A structure to generate x-rays comprising:

a stationary cathode structure having a plurality of stationary and individually electrically addressable field emissive electron sources defining a plurality of cathodes, each cathode disposed on a first side of the cathode structure;

a stationary target structure having a deflection surface oriented non-perpendicularly to the first side of the cathode structure, the deflection surface defining a target;

an object positioner disposed within an imaging zone; and

a detector operatively positioned within the structure to receive and detect an x-ray from the target,

wherein each cathode comprises a substrate and a gate electrode positioned parallel to and insulated from the substrate, the substrate comprising a field emissive material.

2. The structure of claim 1, wherein the field emissive material is selected from the group consisting of single walled carbon nanotubes, double walled carbon nanotubes, multi-wall carbon nanotubes, nanotubes comprising at least one non-carbon element, or a nanorod/nanowire comprising at least one of a metal, a metal oxide, silicon, silicon carbide, silicon oxide, carbon nitride, boron nitride, boron carbide, or a chalcogenide.

3. The structure of claim 1, wherein each of the plurality of cathodes is a recessed well in the cathode structure and into which the substrate is disposed, and the gate electrode is disposed across the surface of the substrate substantially equidistant from the substrate.

4. The structure of claim 1, wherein the plurality of cathodes are each individually positioned on the first surface of the cathode structure at a predetermined interval.

5. The structure of claim 4, wherein the predetermined interval is approximately 10° to 120°.

6. The structure of claim 1, wherein the target is an area array of target material or a plurality of individual target material.

7. The structure of claim 1, further comprising:

an evacuated chamber substantially in the form of a hollow cylinder having an inner wall and an outer wall and adapted to position an object to be imaged by the structure within the imaging zone.

8. The structure of claim 7, further comprising:

a plurality of collimating windows disposed in the inner wall.

9. The structure of claim 1, wherein the target is an area array of individual target material or a line array of target material.

10. The structure of claim 1, wherein the detector is a stationarily positioned charged-coupled device.

11. A method of generating an x-ray image comprising the steps of:

positioning an object within an imaging zone;

switching each of a plurality of cathodes on a stationary cathode structure at a predetermined frequency to field emit an electron, each of the plurality of cathodes individually addressable and electrically switched in a programmable sequence to field emit electrons toward an incidence point on a stationary target structure, the cathode comprising a field emissive electron source;

emitting an x-ray from a target of the stationary target structure at the predetermined frequency;

imaging the object; and

detecting the emitted x-ray,

wherein a position on the stationary target structure from which the x-ray emits corresponds spatially and temporally to a position on the cathode structure from which the electron emits, and

wherein at least one of a circumferential position and an elevation angle of the emitted x-ray is sufficiently discriminated with respect to the object to produce a three dimensional image.

12. The method of claim 11, wherein the field emissive material is selected from the group consisting of single walled carbon nanotubes, double walled carbon nanotubes, multi-wall carbon nanotubes, nanotubes comprising at least one non-carbon element, and nanorods/nanowires comprising at least one of a metal, a metal oxide, silicon, silicon carbide, silicon oxide, carbon nitride, boron nitride, boron carbide, or a chalcogenide.

13. The method of claim 11, wherein the predetermined frequency is in the range of 0.1 Hz to 100 kHz.

14. The method of claim 11, wherein the predetermined frequency is sufficiently rapid to dynamically image a physiological function.

15. The method of claim 11, wherein the electron is non-divergent and accelerated from a field emissive material toward a gate electrode and impacts the target at an incidence point.

16. The method of claim 11, wherein the step of emitting an x-ray forms a pencil-like x-ray beam, the x-ray beam corresponding to one or more pixels of a detecting means utilized in the step of detecting.

17. The method of claim 16, wherein the x-ray beam corresponds to no more than ten pixels.

18. The method of claim 11, wherein the step of emitting an x-ray forms a fan-like x-ray beam, the x-ray beam corresponding to one or more lines of pixels of a detecting means utilized in the step of detecting.

19. The method of claim 18, wherein the x-ray beam corresponds to a line of no more than ten lines of pixels.

20. The method of claim 11, wherein the step of emitting an x-ray forms a cone-like x-ray beam, the x-ray beam corresponding to an area of no more than 128x128 square pixels of a detecting means utilized in the step of detecting.

21. The method of claim 20, wherein the x-ray beam corresponds to an area of no more than 64x64 square pixels.

22. The method of claim 11, wherein a detecting means used in the step of detecting is a charge-coupled device, the charge-coupled device stationarily positioned to detect the emitted x-ray.

23. The method of claim 11, further comprising a step of transferring a detected image resulting from the step of detecting to a computer storage device and refreshing a detecting means for a next image.

24. A structure to generate x-rays comprising:

a plurality of stationary and individually electrically addressable electron sources defining a plurality of cathodes;

at least one target placed opposing the cathodes; and

an evacuated chamber that houses the plurality of cathodes and the at least one target.

25. The structure of claim 24, wherein the electron sources are field emission electron sources.

26. The structure of claim 25, wherein each electron field emission source is a triode-type comprising a field emissive material and a gate electrode positioned parallel to and insulated from a substrate, and

wherein a plurality of electrons are field emitted from the cathode when the electric field between the gate electrode and the field emissive material exceeds a threshold value, and

wherein the plurality of field emitted electrons pass the gate electrode and are further accelerated to impact on the at least one target by an electric field applied between the gate electrode and the at least one target, and

wherein, upon impact, at an incidence point, at least one x-ray having a characteristic wavelength corresponding to a material of the at least one target and at least one x-ray having a continuous wavelength are generated.

27. The structure of claim 25, wherein the field emissive material is selected from the group consisting of single walled carbon nanotubes, double walled carbon nanotubes, multi-wall carbon nanotubes, nanotubes comprising at least one non-carbon element, and nanorods/nanowires comprising at least one of a metal, a metal oxide, silicon, silicon carbide, silicon oxide, carbon nitride, boron nitride, boron carbide, or a chalcogenide.

28. The structure of claim 25, wherein the field emissive material is coated on the substrate as a film, is embedded in a matrix of the substrate, or is a free-standing substrate structure, and the gate electrode is disposed across a surface of the substrate substantially equidistant from the substrate.

29. The structure of claim 24, further comprising:

an evacuated chamber with a plurality of x-ray transparent windows, each window positioned to allow the passage of at least one x-ray beam generated by a plurality of electrons from a corresponding one of the plurality of cathodes,

wherein the plurality of cathodes and the at least one target are disposed within the evacuated chamber and the evacuated chamber is operationally maintained at a pressure lower than 10^{-3} Torr.

30. The structure of claim 24, wherein the plurality of cathodes and the at least one target are each on an opposing plane and the target has a deflection surface that is oriented toward a surface of the plurality of cathodes that emits electrons.

31. The structure of claim 30, wherein the deflection surface is oriented non-parallel to the surface of the plurality of cathodes.

32. The structure of claim 30, wherein each of the plurality of cathodes are individually positioned on one of the opposing planes at a pre-determined interval.

33. The structure of claim 24, wherein the plurality of cathodes are disposed on a first ring and the at least one target is disposed on a second ring, the first and second rings concentric, and the at least one target has a deflection surface that is oriented toward a surface of the plurality of cathodes that emits electrons.

34. The structure of claim 33, wherein the deflection surface is oriented non-parallel to the surface of the plurality of cathodes.

35. The structure of claim 33, wherein each of the plurality of cathodes are individually positioned on one of the first or second rings at a pre-determined interval.

36. A device to record x-ray images, comprising:

an x-ray source comprising a plurality of stationary and individually electrically addressable electron sources defining a plurality of cathodes, the plurality of cathodes disposed on a face of a first planar surface, at least one target disposed on a second planar surface, a deflection surface of the second planar surface opposing the face of the first planar surface, and an evacuated chamber that houses the plurality of cathodes and the at least one target;

an array or matrix of x-ray detectors or x-ray sensitive films opposing the x-ray source, the array or matrix substantially parallel to and at equal distance to the x-ray source; and

an object positioner placed between the x-ray source and the array or matrix.

37. The device of claim 36, wherein the deflection surface is oriented substantially parallel to the face of the plurality of cathodes that emits electrons.

38. The device of claim 36, wherein each of the plurality of electron sources are individually positioned at a pre-determined interval on the face of the plurality of cathodes.

39. The device of claim 36, wherein the x-ray source further comprises a plurality of x-ray transparent windows disposed in a wall of the evacuated chamber, and a plurality of parallel collimators, at least one parallel collimator on each one of the plurality of x-ray transparent windows.

40. The device of claim 36, wherein the object positioner is movable with respect to the x-ray source.

41. The device of claim 36, wherein the detector is a stationarily positioned charged coupled device.

42. A method to obtain an x-ray image, the method comprising:

placing an object in an x-ray source, the x-ray source comprising a plurality of stationary and individually electrically addressable electron sources defining a plurality of cathodes, the plurality of cathodes disposed on a face of a first planar surface, at least one target disposed on a second planar surface, a deflection surface of the second planar surface opposing the face of the first planar surface, and an evacuated chamber that houses the plurality of cathodes and the at least one target, an array or matrix of x-ray detectors or x-ray sensitive films opposing the x-ray source, the array or matrix substantially parallel to and at equal distance to the x-ray source, and an object positioner placed between the x-ray source and the array or matrix;

applying power to at least one of the plurality of cathodes to generate x-ray radiation for a pre-set exposure time;

exposing the object to the x-ray radiation; and

capturing an x-ray image corresponding to the object by either the x-ray detectors or the x-ray sensitive films.

43. The method of claim 42, wherein the power is applied to all of the plurality of cathodes simultaneously.

44. The method of claim 42, wherein the power is applied to a subset of the plurality of cathodes sequentially at a pre-set or variably-set frequency.

45. The method of claim 44, further comprising:

moving or activating the x-ray detectors or the x-ray sensitive films at a corresponding frequency to the pre-set or variably-set frequency to capture the x-ray image.

46. The method of claim 42, wherein a detecting means used in the step of detecting is a charge-coupled device, the charge-coupled device stationarily positioned to detect the emitted x-ray.

47. The method of claim 42, further comprising a step of transferring a detected image resulting from the step of detecting to a computer storage device and refreshing a detecting means for a next image.

48. A device to record x-ray images comprising:

an x-ray source comprising a plurality of stationary and individually electrically addressable electron sources defining a plurality of cathodes, the plurality of cathodes disposed on a surface of a first ring, at least one target disposed on a second ring, a deflection surface of the second ring opposing the surface of the first ring, and an evacuated chamber that houses the plurality of cathodes and the at least one target;

an array or matrix of x-ray detectors or x-ray sensitive films on a surface opposing the x-ray source, the array or matrix substantially concentric to and at equal distance to the x-ray source; and

an object positioner placed between the x-ray source and the array or matrix.

49. The device of claim 48, wherein the first and second ring are concentric.

50. The device of claim 48, wherein each of the plurality of electron sources are individually positioned at a pre-determined interval on the surface of the ring.

51. The device of claim 48, wherein the x-ray source further comprises a plurality of x-ray transparent windows disposed in a wall of the evacuated chamber a plurality of parallel collimators, at least one parallel collimator on each one of the plurality of x-ray transparent windows.

52. The device of claim 48, wherein the object positioner is movable with respect to the x-ray source.

53. The device of claim 48, wherein the detector is a stationarily positioned charged coupled device.

54. A method to obtain an x-ray image, the method comprising:

placing an object in an x-ray source, the x-ray source comprising a plurality of stationary and individually electrically addressable electron sources defining a plurality of cathodes, the plurality of cathodes disposed on a surface of a first ring, at least one target disposed on a second ring, a deflection surface of the second ring opposing the surface of the first ring, and an evacuated chamber that houses the plurality of cathodes and the at least one target, an array or matrix of x-ray detectors or x-ray sensitive films on a surface opposing the x-ray source, the array or matrix substantially concentric to and at equal distance to the x-ray source, and an object positioner placed between the x-ray source and the array or matrix;

applying power to all of the plurality of cathodes to generate x-ray radiation for a pre-set exposure time;

exposing the object to the x-ray radiation; and

capturing an x-ray image corresponding to the object by either the x-ray detectors or the x-ray sensitive films.

55. The method of claim 54, wherein the power is applied to all of the plurality of cathodes simultaneously.

56. The method of claim 54, wherein the power is applied to a subset of the plurality of cathodes sequentially at a pre-set or variably-set frequency.

57. The method of claim 56, further comprising:

moving or activating the x-ray detectors or the x-ray sensitive films at a corresponding frequency to the pre-set or variably-set frequency to capture the x-ray image.

58. The method of claim 54, wherein a detecting means used in the step of capturing an x-ray image is a charge-coupled device, the charge-coupled device stationarily positioned to detect the x-ray radiation.

59. The method of claim 54, further comprising a step of transferring a detected image resulting from the step of capturing an x-ray image to a computer storage device and refreshing a detecting means for a next x-ray image.